

**REMARKS**

Reconsideration and allowance of the subject application are respectfully requested.

Claims 1-22 remain pending, claims 1 and 12 being independent.

**Allowable Subject Matter**

Applicants appreciate the Examiner's indication that claims 5 and 16 would be allowable if rewritten in independent form, including all of the limitations of their respective base claim and any intervening claims. For at least reasons set forth below, Applicants respectfully submit that all pending claims should be indicated as allowable.

**Prior Art Rejection**

Claims 1-4, 6-15, and 17-22 stand rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Jansen et al. (U.S. Patent 5,585,709).<sup>1</sup> This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Independent claim 1 is directed to a position sensing apparatus for deriving rotor position of a synchronous machine from signals output from the machine. The apparatus of claim 1 comprises: a bandpass filter that filters phase voltage signals output from main stator windings of the synchronous machine during AC excitation, thereby extracting a rotor position-indicating component from the phase voltage signals; a converter that converts the filtered phase voltages

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<sup>1</sup> Although the summary of the rejection only refers to claims 1 and 12 as being rejected under 35 U.S.C. § 103, Applicants believe that this grounds of rejection has been asserted against all pending claims except allowable claims 5 and 16 based on the grounds of rejection set forth on pages 2-4 of the Office Action.

into balanced two-phase quadrature signals, the balanced two-phase quadrature signals indicating positioning of the rotor; and an excitation controller for controlling AC excitation frequency, of an AC excitation supplied to an exciter field winding of a stator of the machine, as a function of rotor speed, thereby increasing a position detection range of the position sensing apparatus. Therefore, as clarified by the amendments presented in this response, the apparatus for deriving rotor position of a synchronous machine in claim 1 varies a frequency of AC excitation applied to an exciter field winding of the stator, as a function of rotor speed, to increase a position detection range of the apparatus.

The applied reference, Jansen, discloses a motor drive system, which includes a position and velocity observer 43 for determining rotor position and speed for an AC motor 31. The position and velocity observer 43 determines rotor position and velocity based on measured voltage/current on supply lines 34-36 between an inverter system 38 and the AC motor 31. See, e.g., column 5, lines 11-35.

Applicant submits, however, that Jansen fails to disclose or suggest an apparatus for deriving rotor position as set forth in claim 1, in which, *inter alia*, an excitation controller controls AC excitation frequency, of an AC excitation supplied to an exciter field winding of a stator of the synchronous machine, as a function of rotor speed to increase a position detection range of the position sensing apparatus.

To establish *prima facie* obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of prior art must be supported by some teaching, suggestion, or motivation in the applied reference or in knowledge generally available

to one skilled in the art. *In re Fine*, 837, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a *prima facie* case of obviousness. *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); *In re Ehrreich*, 590 F.2d 902, 908-09, 200 USPQ 504, 510 (CCPA 1979).

At least in view of the above, Applicants respectfully submit that the teachings of Jansen fail to establish *prima facie* obviousness of claim 1, or any claim depending therefrom. Independent claim 12, directed to a position sensing method, and claims depending therefrom are believed to define over Jansen based on similar reasoning to that set forth above with regard to claim 1.

Applicants further note that the Office Action sets forth a prior art rejection under 35 U.S.C. § 103, and thus requires consideration of the factual inquiries of *Graham v. John Deere*, 148 USPQ 459 (1966) for determining obviousness. These factual inquiries include:

- (a) determining the scope and content of the prior art;
- (b) ascertaining the differences between the prior art and claims at issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating evidence of secondary consideration. See, e.g., MPEP § 2141.

If this rejection is maintained, Applicants respectfully request that the Office Action specify what the Examiner deems to be the differences between the prior art and the claims and specify how the prior art is being modified or combined to make up for such differences.

At least in view of the above, Applicants respectfully request reconsideration and withdraw of the Examiner's rejection under 35 U.S.C. § 103.

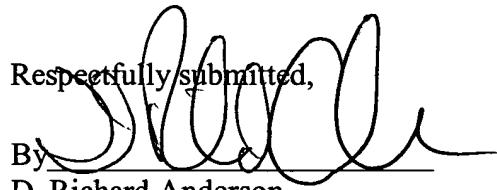
### **Conclusion**

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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